P05732

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF CONNECTICUT

UNITED STATES OF AMERICA, Plaintiff, V. SOLVENTS RECOVERY SERVICE OF NEW ENGLAND, INC., Defendant.	Civil Action No. H-79-704(JAC)

SUPPLEMENTAL DECLARATION OF MATTHEW HOAGLAND

I, Matthew Hoagland, declare as follows:

1. I am presently employed as a Geologist in the Superfund Support Section of the Waste Management Division of the United States Environmental Protection Agency (EPA) Region I in Boston, Massachusetts.

2. On July 6, 1990, I signed a declaration ("July 1990 Declaration") describing my personal background, my involvement with the facility in Southington, Connecticut owned and operated by at Solvents Recovery Service of New England, Inc. (SRSNE), and the requirements imposed on SRSNE under the 1983 Consent Decree with regard to the on-site groundwater recovery system.

3. My July 1990 Declaration also identified several major construction defects in this groundwater recovery system and noted that SRSNE has failed to operate the system as required, to file the required verification reports, to report on groundwater

quality as required. My July 1990 Declaration has been submitted to the Court as Exhibit 1 accompanying the Motion of the United States to Enforce the 1983 Consent Decree.

4. This Supplemental Declaration is submitted in order to address several of the issues raised by SRSNE in its September 27, 1990 opposition to the government's motion to enforce the Consent Decree.

Projected Zone of Influence

5. The 1983 Consent Decree defines the term "cone of influence" but does not determine what the required reach of the cone of influence must be. The shape and extent of the cone of influence was selected by SRSNE and proposed to EPA in the 1983 Engineering Report and the 1984 Final Design Plans. 1983 Engineering Report (Exhibit 8); 1984 Final Design Plans (Exhibit 10). Once EPA approved SRSNE's proposal, SRSNE became obligated to either achieve the projected influence or propose a new cone of influence[1].

6. In developing the projected cone of influence SRSNE should have taken into consideration the slope and elevation of the natural water table. Nevertheless, the Consent Decree and the approved specifications recognized that there would be

---

[1] The term "influence" or "cone of influence" are used in my July 1990 Declaration and in this document in the manner agreed to by SRSNE and EPA in the Consent Decree. Although this definition is close to the scientifically accepted definition of "capture zone", this is of no significance because the definition agreed to for purposes of the Consent Decree is unambiguous and the parties have used the term consistent with the Consent Decree definition since 1983.

uncertainties with respect to these two factors (as well as other factors, such as changes in lithologies). The Consent Decree dealt with these uncertainties by requiring SRSNE to redesign and rebuild the system if it could not meet the projected influence due to design or construction deficiencies. If SRSNE's calculation of the original cone of influence was faulty (e.g. because it failed to take into consideration the actual slope and elevation of the water table or failed to correctly estimate the location of the bedrock), SRSNE was required to revise this aspect the design of its system[2].

7. Similarly, if SRSNE's use of the Theis nonequilibrium equation was a design deficiency as Guswa indicates, SRSNE should have dealt with this deficiency when it was recognized by submitting modified engineering plans and specifications under Par 8.G of the Consent Decree. Guswa Cert. at 9-11.

Penetration of the Aquifer

8. Critical to achieving the overall projected influence is the depth of drawdown at each recovery well. The required drawdowns, as specified by SRSNE in the 1983 Engineering Report and the 1984 Final Design Plans, range from 7.74 feet in the center of the on-site system to 5.17 feet at the extreme ends of

---

[2] The Guswa Certification provides a projected cone of influence for one likely water table slope and elevation setting. Guswa Cert. at Figure 3. This figure is a useful comparison only for water table conditions that repeat the March 11, 1980 condition or for other natural water table elevations with the same slope (realizing that the groundwater isocontour line elevations would also differ accordingly).

the system. These minimum required drawdowns are stated in relation to the natural water level conditions which would otherwise prevail at the site at any time during the day or season at issue. October 1983 Engineering Report at 12 (Exhibit 8); November, 1984 Final Design Plans at 11 and Drawing 3 (Exhibit 10). These minimum drawdowns should not change with slope of the water table, elevation of the water table or lithology of the aquifer materials.

9. As was established in my July 6, 1990 Declaration, three of the 25 on-site system recovery wells (Wells 1, 2 and 19) did not penetrate enough of the aquifer at the time the system began operating. This conclusion was based on the baseline gauge readings without consideration for seasonal fluctuations[3]. July, 1990 Declaration at 12-16 (Exhibit 1); Baseline Gauge Readings (Exhibit 19).

10. The water level measurements provided in the Guswa affidavit regarding the U.S. Geological Survey well WB-198 indicate than many of the other recovery wells also fail to adequately penetrate the aquifer. Guswa Cert. at 12-13. Assuming that Dr. Guswa is correct that the natural fluctuation of water level at the Southington facility about four feet above

---

[3] It should be noted that Table 1 of the Guswa Certification and its supporting description are misleading because the table lists water levels for the wells using data collected at a time prior to when the wells were even installed. The actual length of the water column is more accurately represented by SRSNE's baseline gauge readings. Guswa Cert. at 10 and Table 1; July, 1990 Declaration at 14 (Exhibit 1); Baseline Gauge Readings (Exhibit 19).

and below the baseline elevation, the on-site system wells should have been constructed so that the screens penetrated enough of the aquifer to not only establish their individual drawdowns on the date of initial operation, but to be able to maintain that drawdown relative to a water table that is likely to be lowered by seasonal changes by four feet. If a hypothetical pumping well was required to maintain a drawdown of 6 feet, it would need to be constructed so that it could withstand four feet of seasonal change. Therefore, this hypothetical well would need to penetrate a minimum of 10 feet in order to maintain its required drawdown at all times of the year.

11. Using this analysis, it is clear that four additional wells were not constructed at the proper depth below the water table and that still five other wells would have a margin of safety of less than a foot. A more detailed analysis to support this conclusion is provided as Attachment A.

12. Guswa lists seven recovery wells (Wells 1, 2, 4, 14, 15, 19, and 23) where there were "several measurements which indicated that water levels were at or below the well bottom." It is interesting to note that the seeming success of all seven of these wells is actually a failure for not being installed deeply enough below the water table. This conclusion is evidenced by the flagging of each of these as potential or known problem wells (with an "*") in Attachment A of this Declaration.

Actual Cone of Influence

13. Dr. Guswa recognizes that SRSNE has created a

situation where it is impossible to directly determine the effects of pumping versus seasonal influences when interpreting the water level data measured in the recovery wells as reported in the pre-1990 Hydraulic Verification Reports. Guswa Cert. at 13. There are two additional facts that need to be pointed out when viewing this recovery well data. First, the bubbler tube method, which SRSNE employs, has inherent inaccuracies that are difficult to quantify. Second, the tube is located inside the recovery well and thus does not take into account well loss[4].

14. The February 22, 1990 and May 21, 1990 Hydraulic Verification Reports clearly do not indicate conditions comparable to the Figure 4 of the Guswa Certification. February 22, 1990 Report (Exhibit 42); May 31, 1990 Report (Exhibit 43); Guswa Certification at Figure 4. None of the pre-1990 hydraulic verification reports provide nearly enough data on which to draw a contour map.

Inoperation of the System

15. The Guswa affidavit also provides his opinion that "when operating, the on-site system has been effective in removing contaminated groundwater from beneath the SRSNE site, and has likely prevented off-site migration of contaminated groundwater from the SRSNE site." (emphasis added) is

---

[4] Well loss is defined as the difference in elevation between the water head in the aquifer immediately outside the well bore, and the operating level in the well. Powers, 1981 at 155-157 (Exhibit ___). Well loss at the on-site system recovery wells is likely to be very substantial due to the clogging of the well screens--a fact that SRSNE does not dispute.

unsubstantiatated for several reasons. Guswa Cert. at 3. First, there is no evidence that there was ever a time when all of the wells have operated. Second, there was no disagreement in the SRSNE Response concerning continuous operation statistics. For example, at least one pump was not in operation for 95% of the period of time when operating records exist and at least two pumps were not operating for 42% of this same period. July, 1990 Declaration at 22-25, Attachments A and B (Exhibit 1). Third, SRSNE has neither collected nor presented data to support this conclusion in any of its hydraulic verification reports.

Penetration of the Bedrock

16. The bedrock underlying the SRSNE facility is primarily sandstone and siltstone. Groundwater containing contaminants flows into and out of this bedrock. The groundwater can flow between interconnected pore spaces within the rock or through interconnected fractures, the latter being generally more efficient than the former. The potential also exists where interconnected water bearing fractures may transmit water more efficiently than the overburden aquifer systems.

17. The technology exists to extract contaminated groundwater from bedrock via groundwater recovery wells. Indeed, it is commonplace to develop and implement remedial actions at Superfund Sites based on extraction and treatment of contaminated groundwater from bedrock.

18. As stated above, the recovery wells of the on-site system were each required to be able to produce specific

drawdowns regardless of seasonal changes. The wells were also required to penetrate the bedrock aquifer by three feet. However, if any well could not attain its required drawdown when installed three feet into the bedrock, then the bedrock would have to be further penetrated to satisfy drawdown requirements.

19. SRSNE states, without any technical support, that there is "no groundwater" near Wells 1 and 2 and that there is "no potential for contaminated groundwater to migrate from the SRSNE facility near those wells." SRSNE Opposition at 2. This is clearly wrong. The groundwater is likely to be close to where the SRSNE's own expert, John Guswa, has drawn it in Figure 4 of his Certification. Guswa Cert. at Figure 4.

20. As stated above, the approved specifications contain no maximum depth for the on-site system recovery wells. SRSNE's assumption that there is no potential for groundwater to migrate from near Wells 1 and 2 strongly contradicts boring log information provided to SRSNE by its own consultants in 1982. The boring log for monitoring well WE-3, the closest pre-existing monitoring well to Wells 1 and 2, indicates a thickness of at least 14.5 feet of weathered and fractured bedrock. A zone of highly fractured bedrock is described at a depth of 9.9 feet below the bedrock surface. Two other boring logs for monitoring wells, WE-1 and WE-6, also note the presence of fractured bedrock. Wehran Engineering, January 1983 at Appendix A (Exhibit ___). Thus, future penetration of the bedrock would have both contributed to efficacy of the on-site system and reduced off-

site migration.

Grouping of Wells

21. SRSNE claims that it could not group the wells by flow rate, as required, because EPA would not issue a water discharge permit. Duncan Cert. at 8. This rationale is flawed for three reasons. First, EPA does not issue permits or administrate the water discharge permit program in Connecticut. This program is administered by the State Department of Environmental Protection. SRSNE provides no evidence that it ever contacted the State of Connecticut Department of Environmental Protection with regard to this issue. Second, SRSNE could easily have used alternate methods for disposal of contaminated water off-site. SRSNE could have utilized 55 gallon drums[5] or its own tank trucks to ship the contaminated water to a permitted facility. There are probably very few other companies in New England who are better equipped and have more resources readily available to utilize these alternate methods of disposal. Third, SRSNE could have attempted to regroup the wells after initial startup up of the system in December 1985.

Water Quality

22. Guswa tabulates water quality data for monitoring wells TW-7A, TW-7B and TW-8A for several sampling rounds between the years 1980 to 1989 and concludes that the concentrations of almost all of the chemicals listed have decreased. Guswa Cert.

---

[5] SRSNE's Consultants used drums to store the well water from the pumping test used in the design of the on-site system. Wehran Engineering, January 1983 at 2-11 (Exhibit ___).

at Tables 1-3. Guswa's conclusions raise serious doubts because there is no documentation to support the laboratory quality of these data[6] and there is no documentation recording among other things, whether the samples were representative of the particular aquifer zone being sampled; properly preserved, handled and transported; and analyzed within proper holding times. Notwithstanding these above QA/QC shortcomings, the data provided by Dr. Guswa still indicates that significant groundwater contamination continues to migrate from the SRSNE facility. This fact is further supported by groundwater data collected by NUS, the EPA's RI/FS contractor, last summer during Phase 1 of the Remedial Investigation/Feasibility Study. RI/FS Validated Data Packages (Exhibit ___).

23. Dr. Guswa's Certification also provides calculations supporting a conclusion that eight pounds of volatile organic compounds were being removed per day in 1989. Although I have not confirmed these results, there is little doubt that the number of pounds being removed per day would increase if improvements were made to the on-site system because SRSNE's records show, among other things that for 1989, at least three of the five well pumps were not operating for 60 days (over 16% of the year), at least 2 pumps were not operating for 100 days (27% of the year), and there is no evidence to show that pump number 3

---

[6] Some of the information tabulated in the Guswa Certification was provided to EPA in SRSNE's January 1990 Information Request Response (Exhibit 14). A review of the quality of this data by Moira Lataille of EPA's Lexington, MA laboratory (Exhibit ___).

operated at all.

Redesign of the System

24. SRSNE's primary defense is that the site conditions are different than assumed. SRSNE then implies that the unanticipated conditions make it impossible to achieve compliance with the Consent Decree. There is no foundation for this suggestion. Based on the current information regarding the hydrogeological conditions at the Southington facility, there is no reason to doubt that SRSNE, in consultation with enginee and hydrogeological professionals, could design and construct a groundwater recovery system which would (if operated properly and continuously by SRSNE) maintain an effective barrier to off-site migration.

P05743

ENVIRONMENTAL PROTECTION AGENCY
REGION I
WASTE MANAGEMENT DIVISION
HDA-CAN
BOSTON, MA 02203

TELECOPIER REQUEST

TO: Donna Kiefer

OFFICE: ORC

TELECOPIER NO. _____ CONFIRMING NO. _____

FROM: Matt Hoagland

OFFICE: Region I PHONE: _____

NUMBER OF PAGES INCLUDING COVER PAGE: 12

DATE SENT: _____

TIME: _____

BY: _____

CONFIRMED: _____ YES _____ NO _____ COMMENT